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GOVERNMENT METRO BUS COMMUTERS AND HOUSEHOLD EXPENDITURE: ASSESSING THE ECONOMIC BURDEN AND AFFORDABILITY OF PUBLIC TRANSPORT IN JOS, PLATEAU STATE

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Abstract

Public transportation plays a vital role in promoting economic participation, reducing household expenditure burdens, and improving access to essential services. This study assessed the economic burden and affordability of government metro bus transport in Jos Metropolis, Plateau State, Nigeria. Primary data were collected from 398 commuters using structured questionnaires. An Exploratory Data Analysis (EDA) was conducted to uncover patterns, highlight anomalies, and summarize key variables. This was followed by descriptive statistical analysis and the application of a Generalized Linear Model (GLM) to examine how household transport expenditure relates to income levels and perceptions of fare affordability. Findings indicate that metro bus usage significantly reduces transport costs for most households, with over 50% reallocating savings to essentials such as food, healthcare, and education. Affordability perception was generally positive, though concerns about service reliability persist. The study recommends sustaining fare subsidies, improving service coverage, and incorporating gender- and income-sensitive policies to ensure equitable and sustainable public transport in Jos.

Keywords: Household Expenditure, Metro Bus, Transport Affordability, Jos Metropolis

1. Introduction

Affordable, reliable transportation is integral to urban livelihoods, mediating access to work, healthcare, education, and markets. In Nigeria, the mid-2023 removal of long-standing fuel subsidies triggered an immediate spike in petrol prices (Abayomi, 2023). This policy, although fiscally necessary, exacerbated the cost-of-living crisis, hence, transport fares surged accordingly, squeezing household budgets and disproportionately burdening the economically vulnerable (Punch, 2024; AP News, 2024; Financial Times, 2024).

The fuel subsidy enacted in Nigeria for decades had become financially untenable, costing billions. Its removal promised fiscal savings but came at a heavy social cost: pump prices tripled, inflation surged including food and transport costs and consumer welfare declined sharply (Abayomi, 2023). Within months, transport costs ballooned; reports noted student fares leaping from ₦400 to over ₦1,000, delivering a disproportionate burden on low-income households (Punch, 2024).

Simultaneously, national reforms such as subsidy removal and currency devaluation contributed to widespread inflation and urban hardship, with rural and urban poor alike facing the brunt of soaring prices (Financial Times, 2024). In the Niger Delta, for instance, one village nurse reported that the cost of traveling to the nearest hospital tripled, constraining health access and amplifying isolation (Washington Post, 2025). Moreover, over 31 million Nigerians have experienced acute food shortages, with transport cost increases serving as a significant factor (Reuters, 2024).

Recent studies have taken a closer look at how we define and measure transport poverty and affordability. Verhorst, Fu, and van Lierop (2023) point out that the tools and definitions researchers choose can significantly shape the results of any transport poverty study, making it important to be clear and consistent. Building on that, Alonso-Epelde,

García-Muros, and González-Eguino (2023) have developed a practical way of using household budget surveys to measure transport poverty an approach that can easily be adapted for cities like Jos. From a policy angle, Sovacool and colleagues (2023) show how targeted subsidies, fare controls, and better service design can reduce both transport and energy poverty, lessons that fit well with government-run metro bus programmes. Looking specifically at developing countries, Sogbe, Susilawati, and Tan (2024) reviewed how service quality, passenger satisfaction, and affordability all work together to influence whether people choose to use buses. Finally, Oviedo, Meléndez Fuentes, and Chong (2025) remind us that in Global South settings, affordability thresholds need to reflect local incomes and living costs rather than one-size-fits-all benchmarks.

African and Nigerian evidence brings these ideas closer to home. In Lagos, Ege and Olujimi (2024) found that suburban households spend more than a third of their income on transport, while central residents trade lower transport costs for higher housing expenses. Okunubi, et al. (2024) discovered that many commuters in Lagos, Ibadan, and Abeokuta spend over 10% of their income just getting from place to place—well above international affordability thresholds. Gender adds another layer to the challenge. In Abuja, women tend to earn less, travel longer distances, and end up spending a higher share of their income on transport than men (Abdullah, A., et al., 2022). Looking further afield, Castro et al. (2022) report that in Niamey and Dar es Salaam, the poorest households feel fare increases most sharply, while Myoya et al. (2024) find that in Kenya, Tanzania, and South Africa, high fares and unreliable services together drive much of the dissatisfaction commuters express. Despite these advances in understanding transport poverty and affordability, there is limited empirical evidence on how government-subsidized bus systems in medium-sized African cities actually affect household finances.

Transport is especially critical in medium-sized cities like Jos, Plateau State, where limited mass-transit options force commuters to rely on informal systems such as “okada” motorcycle taxis which are increasing in cost and risk amid inflation (Wikipedia, 2025). In response, the Plateau State government inaugurated a metro bus service intended to offer a reliable, lower-fare alternative, with the potential to ease the economic pressure on households. Despite policy optimism, the actual economic relief afforded by such interventions remains underexplored. This study bridges that gap by empirically assessing household transport expenditure before and after the introduction of the metro bus service in Jos, measuring affordability relative to income levels, and evaluating whether the subsidy or reduced fares translates into meaningful financial respite for commuters.

2. Methodology

Research Design

This study employed a field survey research method to collect primary data from commuters using the Plateau State Government Metro Bus services in Jos metropolis. In addition, a Generalized Linear Model (GLM) was applied to estimate the relationship between public transport costs, household income, and affordability levels. The GLM approach is suitable because the dependent variables—household transport expenditure and affordability ratio are non-negative and may not follow a normal distribution, thereby requiring a model that accounts for non-linear and non-normal data structures (Nelder & Wedderburn, 1972).

Population and sample

The study focused on commuters using the Plateau State Government Metro Bus services within Jos metropolis, covering both Jos North and Jos South Local Government Areas. These areas include a mix of urban and peri-urban communities that rely heavily on public transportation for daily mobility. The target population comprised registered and regular commuters boarding from major terminals and designated bus stops along principal routes.

A total of 398 respondents were selected using a stratified random sampling technique to ensure representation across different routes and travel frequencies. The sample size was determined using the Yamane (1967) formula, applying a 5% level of significance. Respondents were proportionately drawn from key Metro Bus routes,

including Terminus Farin Gada, Terminus–Bukuru, Building Materials–Secretariat, Old Airport–Terminus, and other minor routes.

Model Specification

The study employed a Generalized Linear Model (GLM) to examine the relationship between household transport expenditure, income, and affordability. The model captures non-negative response variables and accounts for potential non-normal data distributions, making it suitable for expenditure data analysis.

The functional form of the model is expressed as:

$TE_i=\beta_0+\beta_1 INC_i+\beta_2 FREQ_i+\beta_3 HHSize_i+\beta_4 Dist_i+\beta_5 AltTrans_i+U_i$

Where:

TEi = Monthly transport expenditure of commuter$_i$

INC_i = Monthly household income

$FREQ_i$ = Frequency of Metro Bus use per week

$HH\ Size_i$ = Household size

$Dist_i$ = Average one-way commuting distance (km)

$AltTrans_i$ = Alternative transport usage (dummy: 1 = Yes, 0 = No)

β_0 = Intercept

$\beta_1 \ldots \beta_5$ = Parameters to be estimated

U_i = Error term

Method of Data Collection

Data were collected through a structured questionnaire administered face-to-face at selected Metro Bus stops and terminals. The questionnaire was divided into sections: Socio-demographic characteristics of respondents, Public Transit Usage frequency, Financial Burden and affodability by household, Monthly transport expenditure and share of income spent on transport, and Perceptions of fare affordability and economic burden. Research assistants were trained to ensure consistent administration, accurate recording, and respectful engagement with respondents. Data collection was conducted during both peak and off-peak hours to capture a diverse commuter profile.

Method of Data Analysis

An Exploratory Data Analysis (EDA) approach was used to identify patterns, detect anomalies, and summarize key variables before statistical modeling. Descriptive statistics such as means, percentages, and frequency distributions were generated to profile respondents and assess spending behavior. Graphical visualizations bar charts and pie charts were used to display the distribution of Metro Bus usage frequency, monthly fare expenditure, and affordability perceptions. The GLM was then applied to estimate the effects of income, travel frequency, and other factors on household transport expenditure and affordability.

Results and Discussions

1. Metro Bus Usage and Spending Patterns

Respondents exhibited high reliance on metro buses, with 29.1% using the service daily and 26.4% commuting 4–6 times a week (Figure 1). This pattern demonstrates the essential role metro buses play in urban mobility for Jos residents. In terms of cost, the majority of users (73.6%) spend between ₦5,000 and ₦10,000 monthly on bus fares (Figure 2), suggesting a fare burden centered within the lower-middle income brackets. This spending range reflects economic sensitivity to transport costs among commuters.

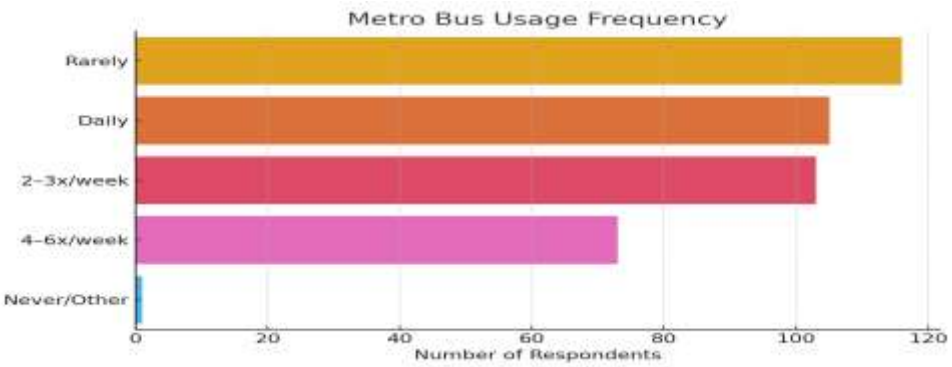

Figure 1: Frequency of Metro Bus Use Among Respondents

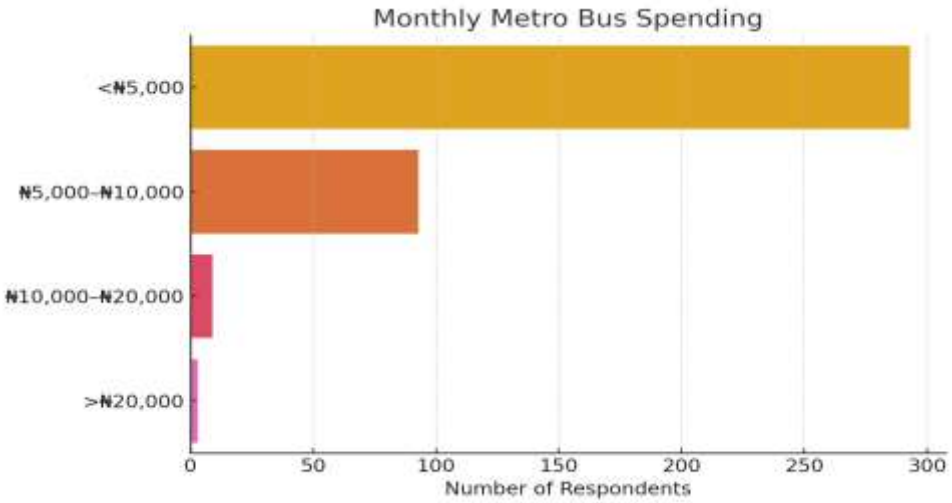

Figure 2: Monthly Spending on Metro Bus Fares

2. Perceived Affordability and Economic Relief

A significant majority (83.9%) perceive metro bus fares as "somewhat affordable," while only 12.3% view them as unaffordable (Figure 4). Notably, government fare reductions have yielded clear economic benefits: 52.8% of respondents reported reallocating saved funds to basic needs like food and healthcare, and 21.6% reported decreased transportation-related stress (Figure 3). These figures affirm the redistributive impact of subsidized transport on household finances.

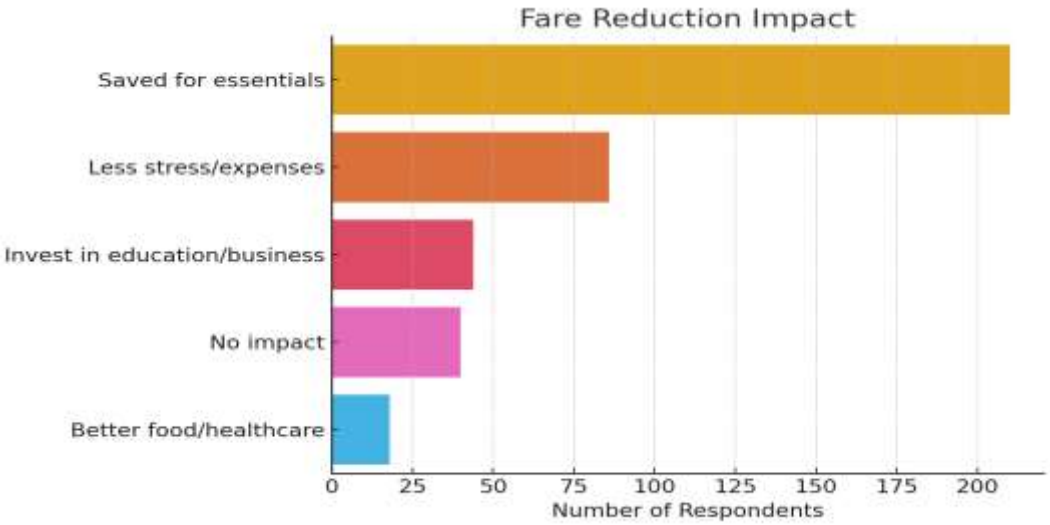

Figure 3: Reported Impact of Fare Reductions on Economic Well-being

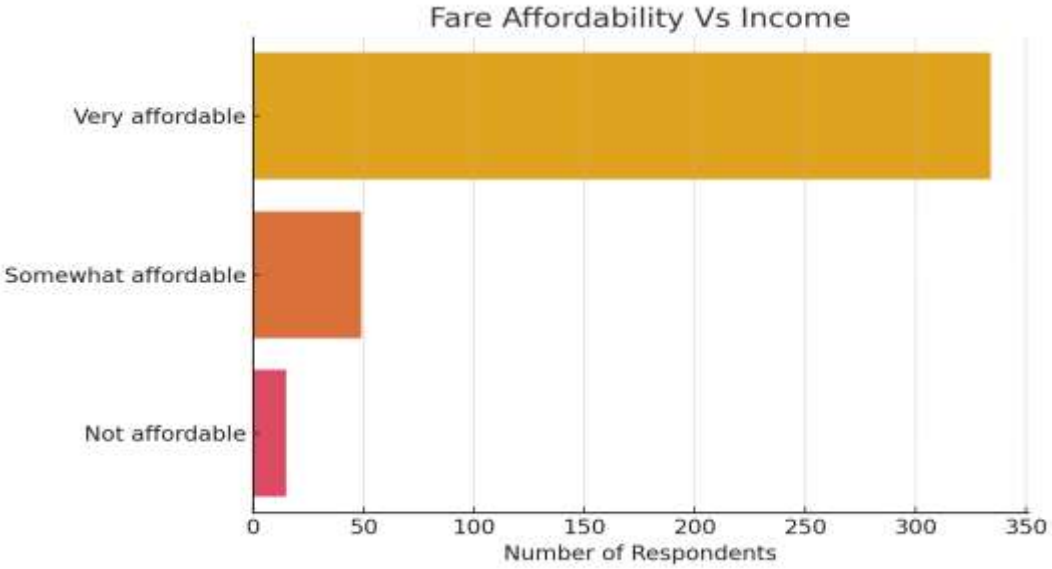

Figure 4: Reported Impact of Fare Reductions on Economic Well-being

3. Fare Burden Relative to Income

Most respondents (55.5%) spend 5% to 10% of their income on transportation, while 41.5% spend less than 5% (Figure 5). These statistics support the conclusion that for many households, metro bus use remains relatively affordable in relation to income—an important factor in assessing transport equity.

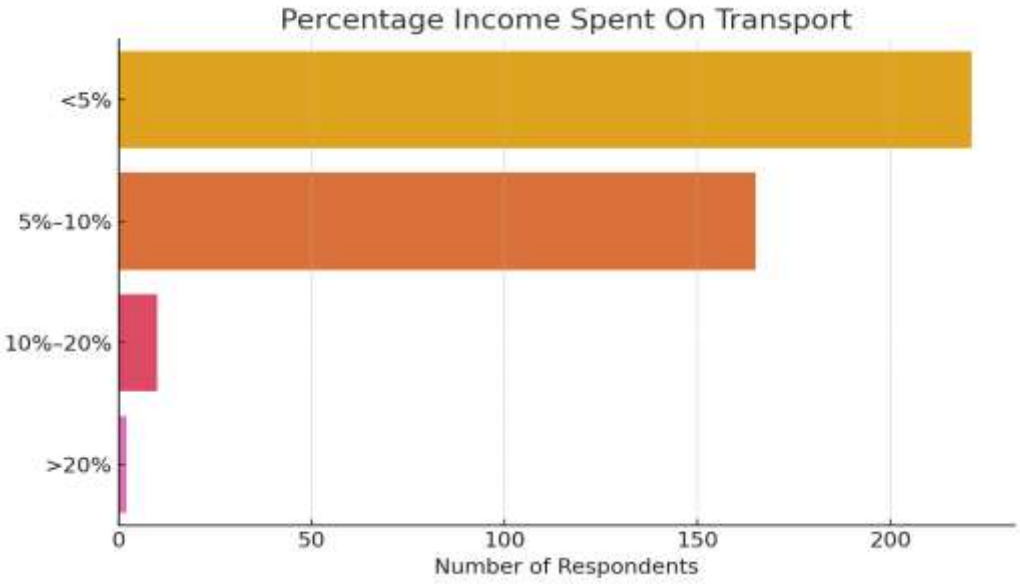

Figure 5: Share of Monthly Income Spent on Metro Transport

4. Policy Support and System Reliability

Public sentiment strongly favors subsidy continuation: 68.8% support further fare reductions or subsidies (Figure 6). However, there is growing concern around service reliability. While 51.5% report a slight reduction in the number of operational buses, 15.3% cite a significant reduction (Figure 7). These disruptions could undermine public confidence and reduce the effectiveness of subsidies.

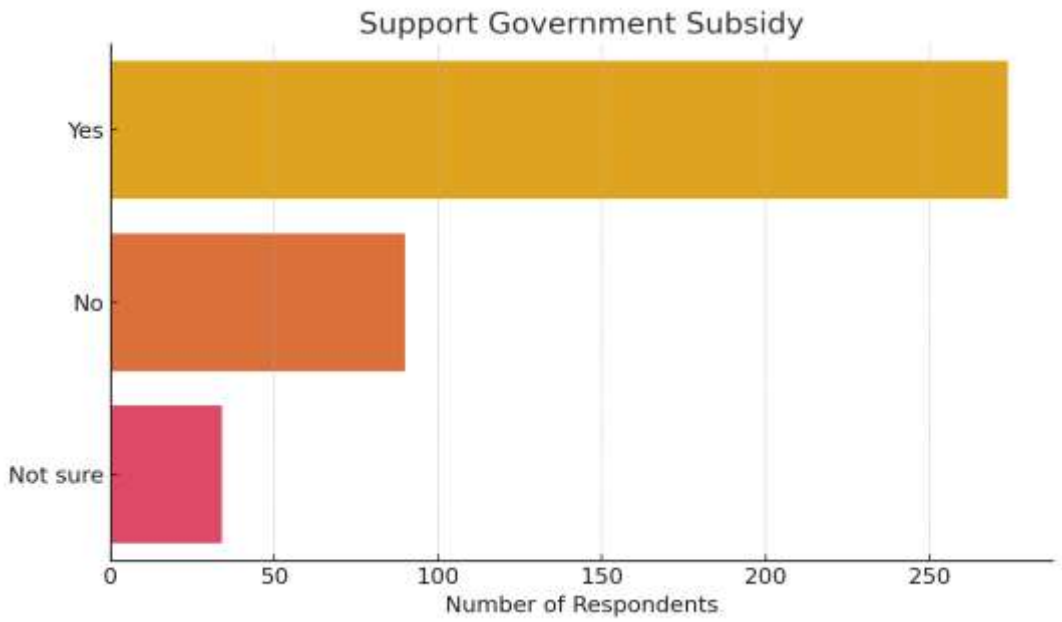

Figure 6: Public Support for Metro Fare Subsidy

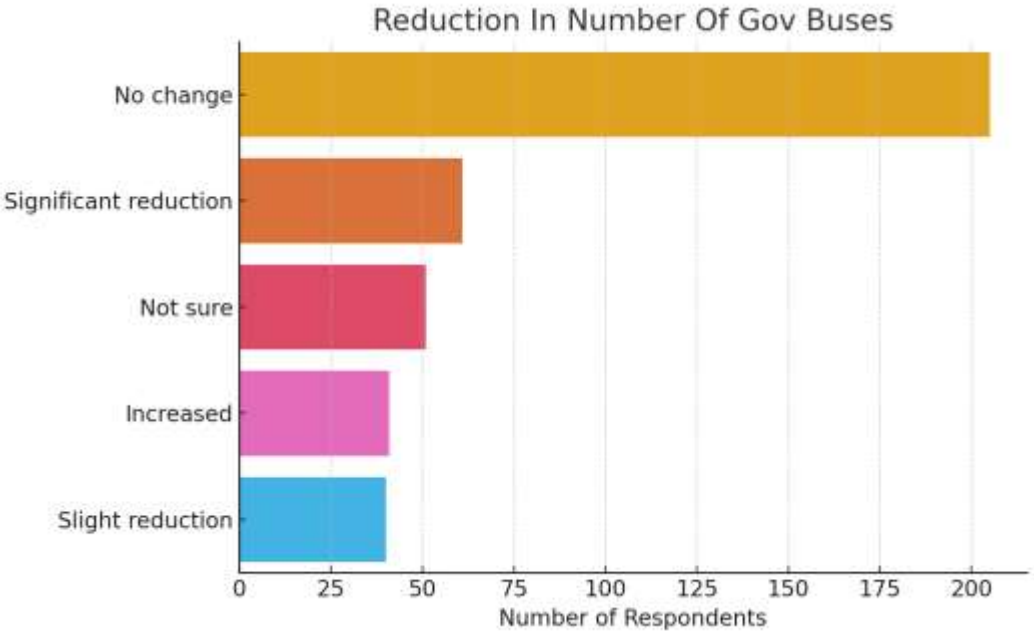

Figure 7: Perceived Reduction in Number of Government Metro Buses Operating

5. Gender and Fare Affordability (Statistical Test)

A chi-square test found a statistically significant association between gender and fare affordability perceptions ($Chi^2 = 28.14$, $p < 0.000001$). This result suggests gender-specific experiences of cost burden or satisfaction with transport pricing, highlighting the need for more granular, equity-sensitive transport policy.

4. Conclusions and Policy Recommendations

i. Sustain and Expand Subsidies: Continue and increase subsidies, with prioritization for low-income, high-frequency users.
ii. Improve Service Coverage: Address service decline via vehicle fleet renewal, strategic route planning, and operational efficiency.
iii. Equity Monitoring: Introduce transport indicators disaggregated by gender and income to assess policy equity and impact.
iv. Public Engagement: Institutionalize regular user feedback to improve affordability, convenience, and reliability of services.

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